

IN THE CLAIMS:

Please re-write the claims as follows:

Please cancel claims 6, 7, 19-26, 30-35, 41, 50, 52-57, 78, and 79 without prejudice.

1.-11. (Cancelled)

1 12. (Previously Presented) A computer implemented storage system for using a net-
2 worked environment capable of accepting write operations directed to files currently un-
3 dergoing a write allocation procedure, the storage system comprising:
4 means for receiving write operations containing data directed to the file;
5 means for using a consistency point counter to label modified data as belonging to
6 the current consistency point or to the next consistency point; and
7 means for capturing data modified for the current consistency point in the current
8 consistency point and not capturing data belonging to the next consistency point.

1 13. (Previously Presented) The storage system of claim 12 further comprising:
2 means for associating the received data with a buffer data control structure; and
3 means for setting a pointer in the buffer data control structure.

1 14. (Previously Presented) The storage system of claim 12 wherein a second pointer
2 in the buffer data control structure points to data already written to the file.

1 15. (Previously Presented) A storage system adapted to enable write operations to a
2 file undergoing write allocation, the storage system comprising:

3 a write allocation process of a file system, the write allocation process adapted to
4 associate received file data with a buffer data control structure upon receipt of a write op-
5 eration directed to the file while the file is undergoing write allocation; and

6 a consistency point counter used to label modified data as belonging to the current
7 consistency point or to the next consistency point, and capturing data modified for the
8 current consistency point in the current consistency point and not capturing data belong-
9 ing to the next consistency point.

1 16. (Previously Presented) The storage system of claim 15 wherein the buffer data
2 control structure comprises a flags array having an entry associated with a current consis-
3 tency point and an entry associated with a next consistency point.

1 17. (Original) The storage system of claim 16 wherein the entry associated with the
2 current consistency point is identified by performing addition modulo addition to a con-
3 sistency point counter.

1 18. (Original) The storage system of claim 16 wherein the entry associated with the
2 next consistency point counter is identified by performing addition modulo two to a con-
3 sistency point counter.

19.-26. (Cancelled)

1 27. (Previously Presented) A computer implemented buffer data control structure for
2 use in a storage operating system permitting write operations to files undergoing a write
3 allocation procedure, the buffer data control structure comprising:

4 a flags array having entries for flags associated with a current consistency point
5 and entries associated with a next consistency point;

6 a first data pointer pointing to file data associated with the current consistency
7 point;

8 a second data pointer pointing to file data associated with the next consistency
9 point; and

10 a consistency point counter used to label modified data as belonging to the current
11 consistency point or to the next consistency point, and capturing data modified for the
12 current consistency point in the current consistency point and not capturing data belong-
13 ing to the next consistency point.

1 28. (Previously Presented) The computer implemented buffer data control structure of
2 claim 27 wherein the flags associated with a current consistency point are identified by
3 performing addition modulo two to a consistency point counter.

1 29. (Previously Presented) The computer implemented buffer data control structure of
2 claim 27 wherein the flags associated with the next consistency point are identified by
3 performing addition modulo two to a consistency point counter.

30.-35. (Cancelled)

1 36. (Previously Presented) A computer system for processing a write operation to a
2 file, while the file is undergoing a write allocation procedure, without delaying the write
3 operation, the system comprising:

4 means for receiving the write operation and information associated therewith, the
5 write operation directed to the file during a next consistency point; and

6 means for differentiating the information associated with the write operation from
7 information currently undergoing write operation to capture data modified for the current
8 consistency point in the current consistency point and not capture data directed to be writ-
9 ten during the next consistency point.

1 37. (Previously Presented) The computer system of claim 36 wherein means for dif-
2 ferentiating further comprises means for modifying an inode associated with the file.

1 38. (Previously Presented) The computer system of claim 37 wherein the inode com-
2 prises an in core section and an on disk section.

1 39. (Previously Presented) The computer system of claim 37 wherein means for
2 modifying the inode further comprises means for modifying a flag in a flag field of the
3 inode.

1 40. (Previously Presented) The computer system of claim 39 wherein means for
2 modifying the flag further comprises means for indicating the file was modified during a
3 consistency point.

41. (Cancelled)

1 42. (Previously Presented) A computer implemented method for managing a storage
2 system, comprising:
3 receiving data directed to the file system;
4 labeling the data as belonging to a current consistency point or to a next consis-
5 tency point; and
6 capturing, in the current consistency point, data belonging to the current consis-
7 tency point and not capturing data belonging to the next consistency point.

1 43. (Previously Presented) The method of claim 42 further comprising:
2 selecting a time for writing the current consistency point to persistent storage;
3 locating buffer data which has been written to a buffer but which has not been
4 written to persistent storage before the time selected for the current consistency point to
5 be written to persistent storage; and
6 capturing the buffer data into the current consistency point.

- 1 44. (Previously Presented) The method of claim 42 further comprising:
2 maintaining a flags array in a buffer data control structure, the flags array having
3 entries associated with a current consistency point and with a next consistency point.
- 1 45. (Previously Presented) The method of claim 44 further comprising:
2 using a monotonically increasing consistency point (CP) counter to identify the
3 current CP as the current value of the CP counter, and the next CP as the value of the CP
4 counter plus 1.
- 1 46. (Previously Presented) The method of claim 45 further comprising:
2 utilizing modulo-two arithmetic with the CP counter to perform an AND opera-
3 tion using “CP AND 1” to obtain a first value of 0 or 1; and
4 utilizing modulo-two arithmetic with the CP counter to perform an AND opera-
5 tion using “1-(CP AND 1)” to obtain a second value of 0 or 1, to produce flag values al-
6 ternating between values of “0” and “1” to represent current and next consistency points.
- 1 47. (Previously Presented) The method of claim 42 further comprising:
2 associating the received data with a buffer data control structure by setting a
3 pointer in the buffer data control structure to a memory location associated with the re-
4 ceived data.
- 1 48. (Previously Presented) The method of claim 47 further comprising:
2 marking the buffer data control structure as being dirty for a next consistency
3 point by setting a flag in a flags array of the buffer data control structure.
- 1 49. (Previously Presented) The method of claim 42 further comprising:
2 differentiating entries associated with the current consistency point and the next
3 consistency point by performing modulo two addition to a consistency point counter.

50.-57. (Cancelled)

1 58. (Previously Presented) A computer readable media, comprising:
2 said computer readable media containing instructions for execution on a proc-
3 essor for the practice of a method of managing data directed to a file served by a stor-
4 age system, the method having the steps of:
5 having data directed to the file, the data received from a write operation;
6 labeling data modified in response to the write operation as belonging to the
7 current consistency point or to the next consistency point; and
8 capturing, in the current consistency point, data belonging to the current con-
9 sistency point and not capturing data belonging to the next consistency point.

1 59. (Previously Presented) A computer implemented method for managing a file sys-
2 tem, comprising:
3 receiving data directed to the file system;
4 labeling the data as belonging to a current consistency point or to a next consis-
5 tency point; and
6 allocating disk space for data belonging to the current consistency point, and not
7 allocating disk space for data belonging to the next consistency point.

1 60. (Previously Presented) The method of claim 59 further comprising:
2 selecting a time for writing the current consistency point to persistent storage;
3 locating buffer data which has been written to a buffer but which has not been
4 written to persistent storage before the time selected for writing the current consistency
5 point; and
6 capturing the buffer data into the current consistency point.

1 61. (Previously Presented) The method of claim 60 further comprising:

2 locating buffer data which has been written to a buffer after the time selected for
3 writing the current consistency point; and
4 capturing the buffer data into the next consistency point.

1 62. (Previously Presented) The method of claim 59 further comprising:
2 maintaining a flags array in a buffer data control structure, the flags array having
3 entries associated with a current consistency point and with a next consistency point.

1 63. (Previously Presented) The method of claim 62 further comprising:
2 using a monotonically increasing consistency point (CP) counter to identify the
3 current CP as the current value of the CP counter, and the next CP as the value of the CP
4 counter plus 1.

1 64. (Previously Presented) The method of claim 63 further comprising:
2 utilizing modulo-two arithmetic with the CP counter to perform an AND opera-
3 tion using “CP AND 1” to obtain a first value of 0 or 1; and
4 utilizing modulo-two arithmetic with the CP counter to perform an AND opera-
5 tion using “1-(CP AND 1)” to obtain a second value of 0 or 1, to produce flag values al-
6 ternating between values of “0” and “1” to represent current and next consistency points.

1 65. (Previously Presented) The method of claim 59 further comprising:
2 associating the received data with a buffer data control structure by setting a
3 pointer in the buffer data control structure to a memory location associated with the re-
4 ceived data.

1 66. (Previously Presented) The method of claim 65 further comprising:
2 marking the buffer data control structure as being dirty for a next consistency
3 point by setting a flag in a flags array of the buffer data control structure.

- 1 67. (Previously Presented) The method of claim 59 further comprising:
2 differentiating entries associated with the current consistency point and the next
3 consistency point by performing modulo two addition to a consistency point counter.
- 1 68. (Previously Presented) A computer implemented method for managing a file sys-
2 tem, comprising:
3 means for receiving data directed to the file system;
4 means for labeling the data as belonging to a current consistency point or to a next
5 consistency point; and
6 means for allocating disk space for data belonging to the current consistency
7 point, and not allocating disk space for data belonging to the next consistency point.
- 1 69. (Previously Presented) A computer implemented file system, comprising:
2 a network adapter to receive data directed to the file system;
3 an operating system to label the data as belonging to a current consistency point
4 or to a next consistency point; and
5 a storage adapter to allocate disk space for data belonging to the current consis-
6 tency point, and not allocating disk space for data belonging to the next consistency
7 point.
- 1 70. (Previously Presented) The system of claim 69 further comprising:
2 a processor to select a time for writing the current consistency point to persistent
3 storage;
4 buffer data which has been written to a buffer but which has not been written to
5 persistent storage before the time selected for writing the current consistency point; and
6 the operating system to capture the buffer data into the current consistency point.
- 1 71. (Previously Presented) The system of claim 69 further comprising:

2 a flags array in a buffer data control structure, the flags array having entries asso-
3 ciated with a current consistency point and with the next consistency point.

1 72. (Previously Presented) The system of claim 71 further comprising:
2 a monotonically increasing consistency point (CP) counter to identify the current
3 CP as the current value of the CP counter, and the next CP as the value of the CP counter
4 plus 1.

1 73. (Previously Presented) The system of claim 72 further comprising:
2 a modulo-two arithmetic with the CP counter to perform an AND operation using
3 “CP AND 1” to obtain a first value of 0 or 1; and
4 the modulo-two arithmetic with the CP counter to perform an AND operation us-
5 ing “1-(CP AND 1)” to obtain a second value of 0 or 1, to produce flag values alternating
6 between values of “0” and “1” to represent current and next consistency points.

1 74. (Previously Presented) The system of claim 69 further comprising:
2 the operating system to associate the received data with a buffer data control
3 structure by setting a pointer in the buffer data control structure to a memory location as-
4 sociated with the received data.

1 75. (Previously Presented) The system of claim 74 further comprising:
2 the operating system to mark the buffer data control structure as being dirty for a
3 next consistency point by setting a flag in a flags array of the buffer data control struc-
4 ture.

1 76. (Previously Presented) The system of claim 69 further comprising:
2 the operating system to differentiate entries associated with the current consis-
3 tency point and the next consistency point by performing modulo two addition to a con-
4 sistency point counter.

- 1 77. (Previously Presented) A computer readable media, comprising:
2 said computer readable media containing instructions for execution on a processor
3 for the practice of a method of managing a file system, the method having the steps of,
4 receiving data directed to the file system;
5 labeling the data as belonging to a current consistency point or to a next consis-
6 tency point; and
7 allocating disk space for data belonging to the current consistency point, and not
8 allocating disk space for data belonging to the next consistency point.

78.-79. (Cancelled)